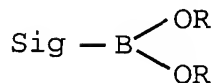


WHAT IS CLAIMED IS:

1. A compound I having the formula:



I

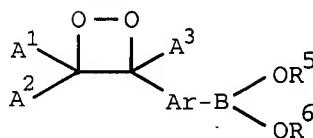
wherein Sig comprises an aromatic or heteroaromatic ring
5 group and is capable of being detected by a detectable
property when the group $\text{B}(\text{OR})_2$ is replaced by a hydroxyl
group ($-\text{OH}$) or its anion ($-\text{O}^-$), B is a boron atom, each R
is independently selected from hydrogen and lower alkyl
groups and can be joined together as a straight or branched
10 alkylene chain forming a five or six-membered ring or an
arylene ring, wherein the compound of formula I itself does
not possess the detectable property or does so only to a
very weak degree and the detectable property is selected
from chemiluminescence or bioluminescence.

2. The compound of claim 1 wherein the detectable property
is chemiluminescence.

3. The compound of claim 1 wherein the detectable property
is bioluminescence.

4. The compound of claim 1 wherein the group Sig further
comprises a dioxetane ring attached to the aromatic or
heteroaromatic ring group.

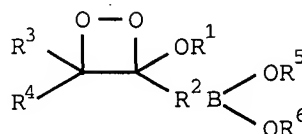
5. The compound of claim 4 having the formula:



wherein A¹ - A³ represent organic groups having from 1-20
 5 carbon atoms and can optionally contain heteroatoms
 selected from N, O and S atoms, and Ar is an aromatic or
 heteroaromatic ring group, and wherein A¹-A³, and Ar can be
 substituted with non-hydrogen atoms, and R⁵ and R⁶ are
 independently selected from hydrogen and lower alkyl groups
 10 and can be joined together as a straight or branched
 alkylene chain forming a five or six-membered ring or an
 arylene ring.

6. The compound of claim 4 wherein A¹ and A² or A¹ and A³
 or A³ and Ar are combined to form a ring.

7. The compound of claim 4 wherein the dioxetane has the formula:



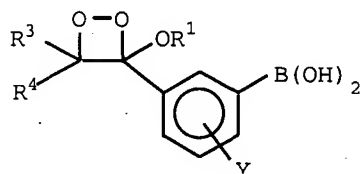
5 wherein R¹ is an organic group having from 1-20 carbon atoms which can be combined with R² or R³, R² is an aromatic or heteroaromatic ring group which can include additional substituents selected from halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl, amino and alkylamino groups, and R³ and R⁴ are
10 independently selected from acyclic and cyclic organic groups containing from 3-20 carbon atoms and which can be substituted with heteroatoms.

8. The compound of claim 7 wherein R³ and R⁴ are combined together in a cyclic or polycyclic alkyl or a cyclic or polycyclic alkenyl group which is spiro-fused to the dioxetane ring and contains 6 to 20 carbon atoms and which
5 can include additional non-hydrogen substituents.

9. The compound of claim 7 wherein R³ and R⁴ are combined together to form an adamantyl group which can be substituted with one or more substituent groups selected from halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl, phenyl, substituted phenyl, amino and alkylamino groups.
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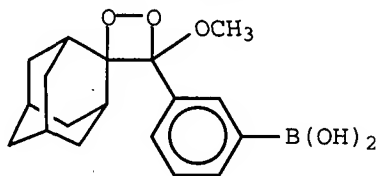
10. The compound of claim 7 wherein R^3 and R^4 are each branched alkyl or cycloalkyl groups having from 3-20 carbon atoms.

11. The compound of claim 7 having the formula:

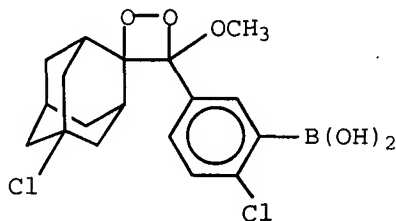


5 wherein Y is a substituent group selected from hydrogen, halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl, phenyl, substituted phenyl, amino and alkylamino groups.

12. The compound of claim 9 having the formula:

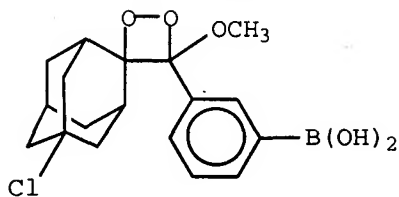


13. The compound of claim 11 having the formula:



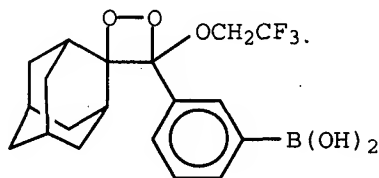
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14. The compound of claim 9 having the formula:



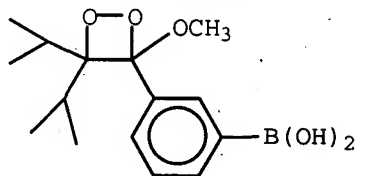
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15. The compound of claim 9 having the formula:



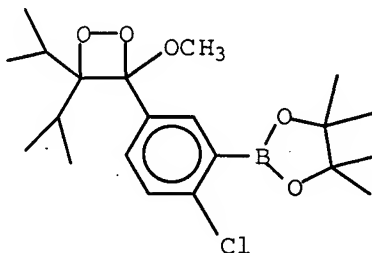
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16. The compound of claim 9 having the formula:



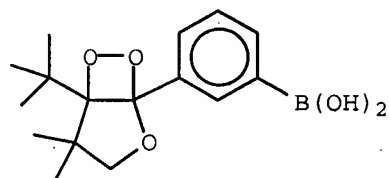
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17. The compound of claim 9 having the formula:



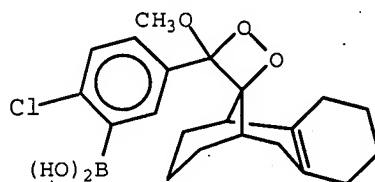
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18. The compound of claim 9 having the formula:



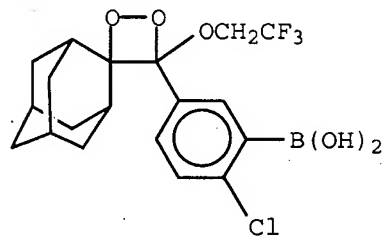
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19. The compound of claim 8 having the formula:



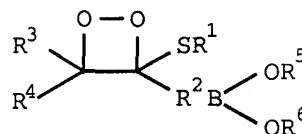
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20. The compound of claim 9 having the formula:



5

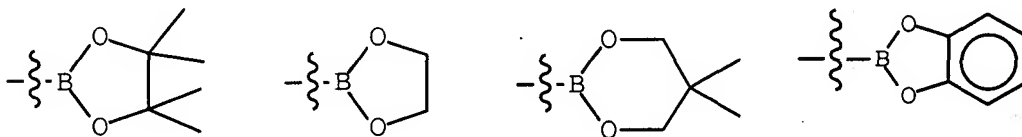
21. The compound of claim 5 wherein the dioxetane has the formula:



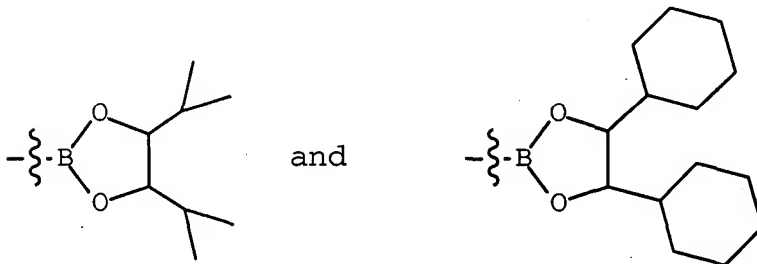
- 5 wherein R¹ is an organic group having from 1-20 carbon atoms which can be combined with R² or R³, R² is an aromatic or heteroaromatic ring group which can include additional substituents selected from halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl, amino and alkylamino groups, and R³ and R⁴ are
 10 independently selected from acyclic and cyclic organic groups containing from 3-20 carbon atoms and which can be substituted with heteroatoms.

22. The compound of claim 5 wherein R⁵ and R⁶ are each hydrogen atoms.

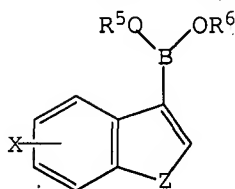
23. The compound of claim 5 wherein R⁵ and R⁶ are combined
 5 to form a ring selected from:



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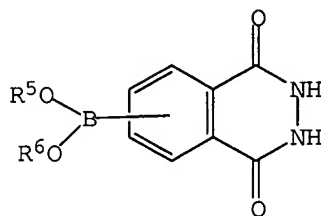


24. The compound of claim 1 having the formula:



5 wherein Z is selected from O, S and NR^8 , wherein R^8 is H or $Si(R^9)_3$, R^9 is C_1 - C_6 alkyl or phenyl, and X represents one or two iodine, bromine or chlorine atoms, and R^5 and R^6 are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched
10 alkylene chain forming a five or six-membered ring or an arylene ring.

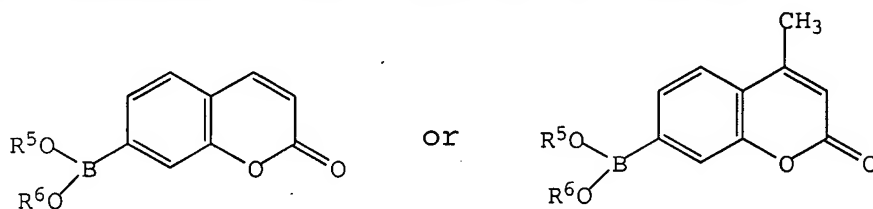
25. The compound of claim 1 having the formula:



5

wherein R^5 and R^6 are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

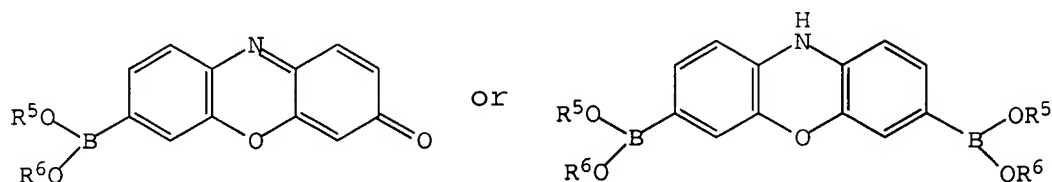
26. The compound of claim 1 having the formula:



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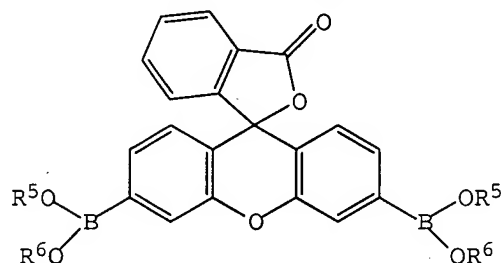
wherein R^5 and R^6 are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

27. The compound of claim 1 having the formula:



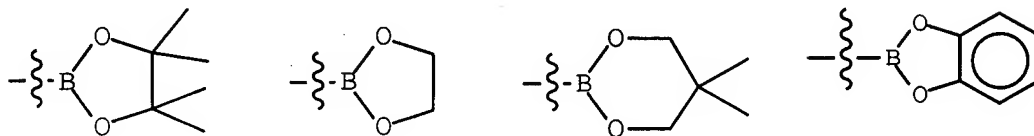
- 5 wherein R⁵ and R⁶ are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

28. The compound of claim 1 having the formula:

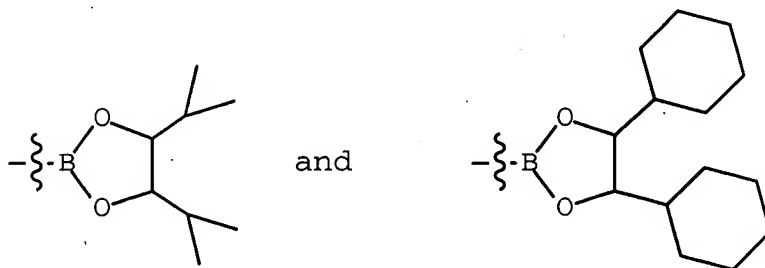


- 5 wherein R⁵ and R⁶ are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

29. The compound of claim 1 wherein the R groups are combined to form a ring selected from:

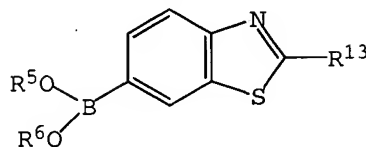


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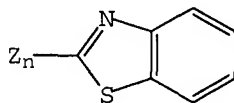


30. The compound of claim 1 wherein the R groups are both hydrogen atoms.

31. A compound having the formula:

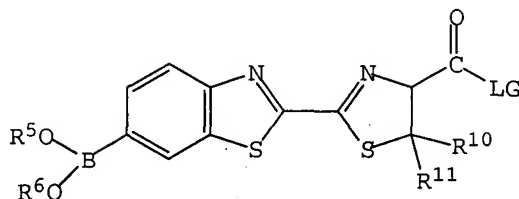


- 5 which is capable of being detected by a detectable property selected from fluorescence, chemiluminescence or bioluminescence when the group $B(OR^5)(OR^6)$ is replaced by a hydroxyl group ($-OH$) or its anion ($-O^-$), wherein B is a boron atom, R^5 and R^6 are independently selected from
- 10 hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring, and R^{13} is independently selected from cyano, imine, carbonyl, thiazole, carbonyl-substituted thiazole and benzothiazole
- 15 groups or a group



- wherein Z is C-C double or triple bond or aromatic ring and n is 1 or 2, wherein the compound itself does not possess
- 20 the detectable property or does so only to a very weak degree.

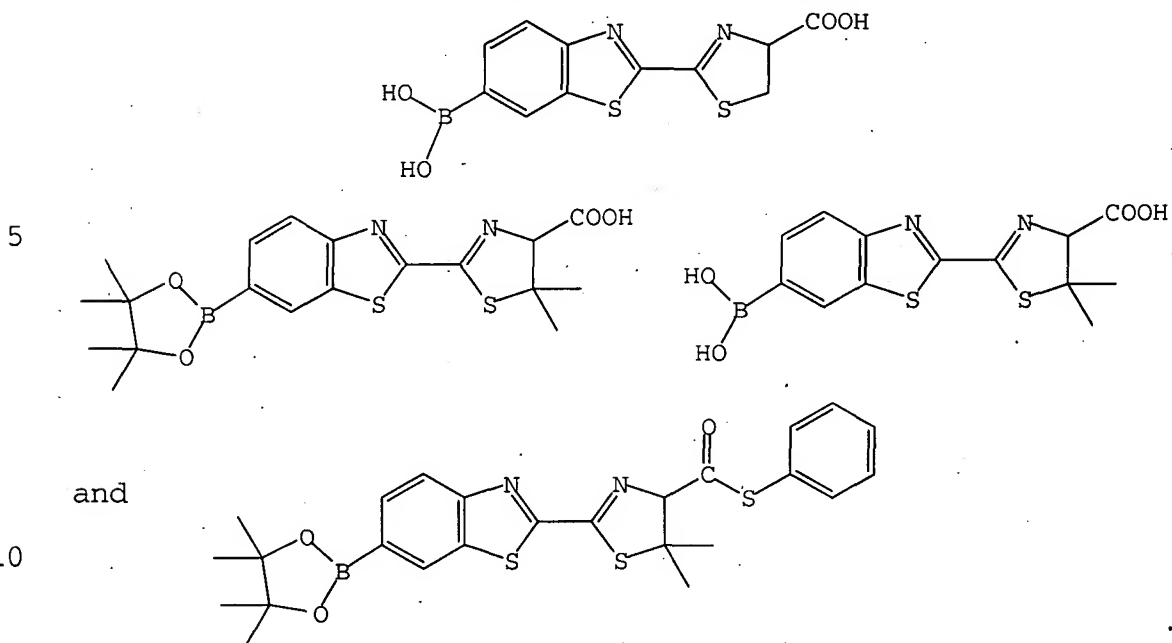
32. The compound of claim 31 having the formula:



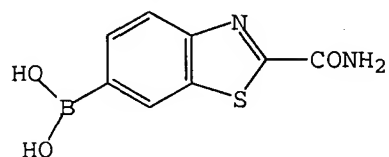
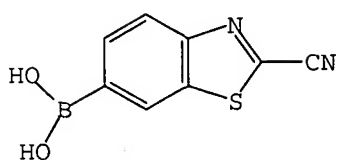
5 wherein LG is a leaving group and R^{10} and R^{11} are hydrogen or C_1 - C_4 alkyl, and R^5 and R^6 are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

33. The compound of claim 32 wherein the leaving group is selected from OH, OR^{12} , SR^{12} and O-AMP groups, R^{12} is a substituted or unsubstituted alkyl or aryl group, and AMP is adenosine monophosphate.

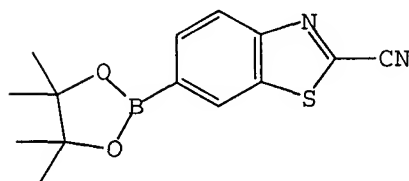
34. The compound of claim 32 selected from the group:



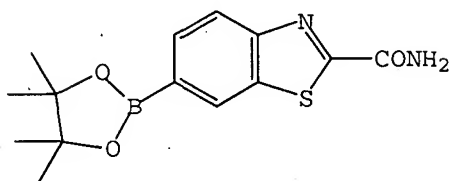
35. The compound of claim 31 selected from the group:



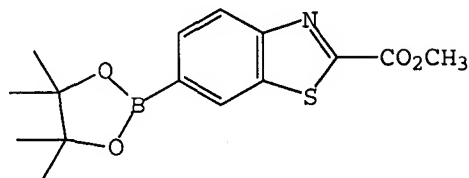
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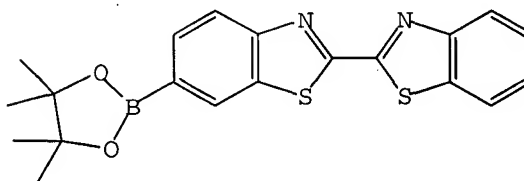
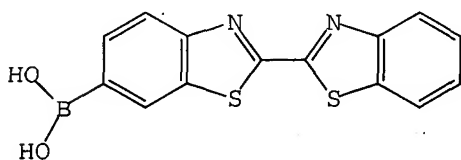
10



and



36. The compound of claim 31 selected from the group:



5

and

